

Great Lakes Binational Toxics Strategy Stakeholder Forum

**Windsor, Ontario
Canada**

May 29, 2002

PCBs

Work Group Co-Chairs:

Ken De, Environment Canada

Tony Martig, U.S. EPA

PCB Challenges

Canada

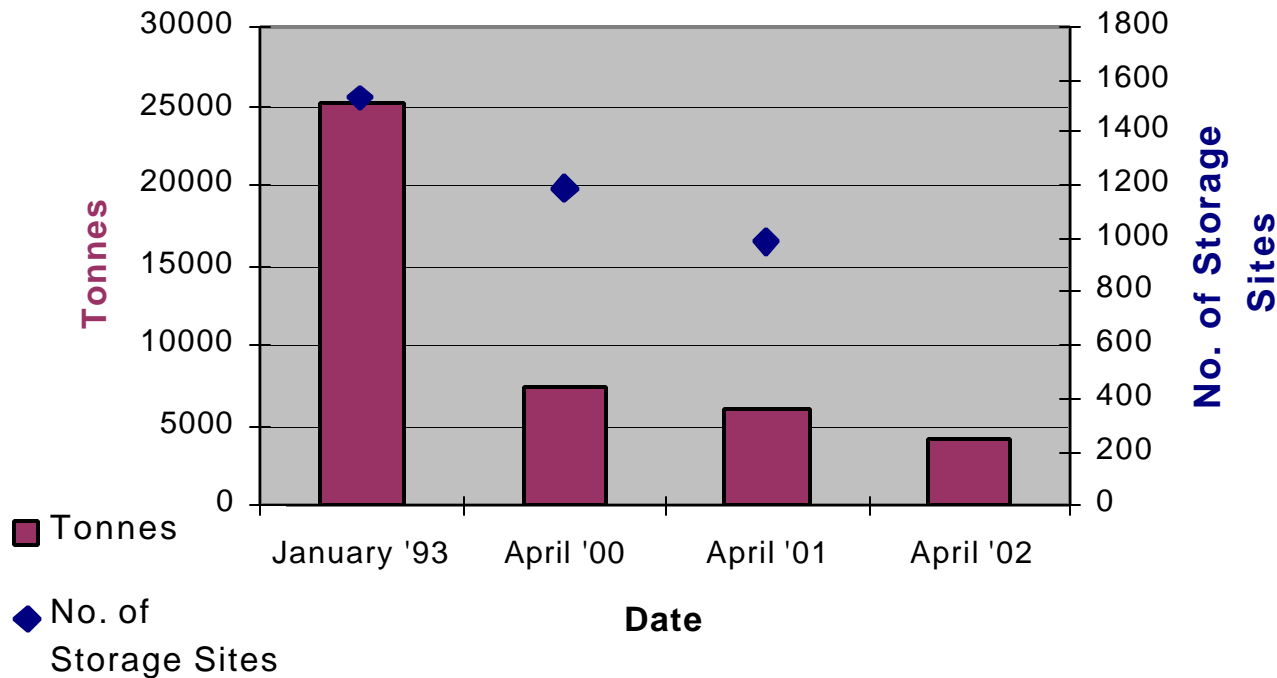
“Seek by 2000, a 90 percent reduction of high level PCBs (>1 percent PCB) that were once, or are currently, in service and accelerate destruction of stored high-level PCB wastes which have the potential to enter the Great Lakes Basin, consistent with the 1994 COA.”

United States

“Seek by 2006, a 90% reduction nationally of high-level PCBs (>500 ppm) used in electrical equipment. Ensure that all PCBs retired from use are properly managed and disposed of to prevent releases within or to the Great Lakes Basin.”

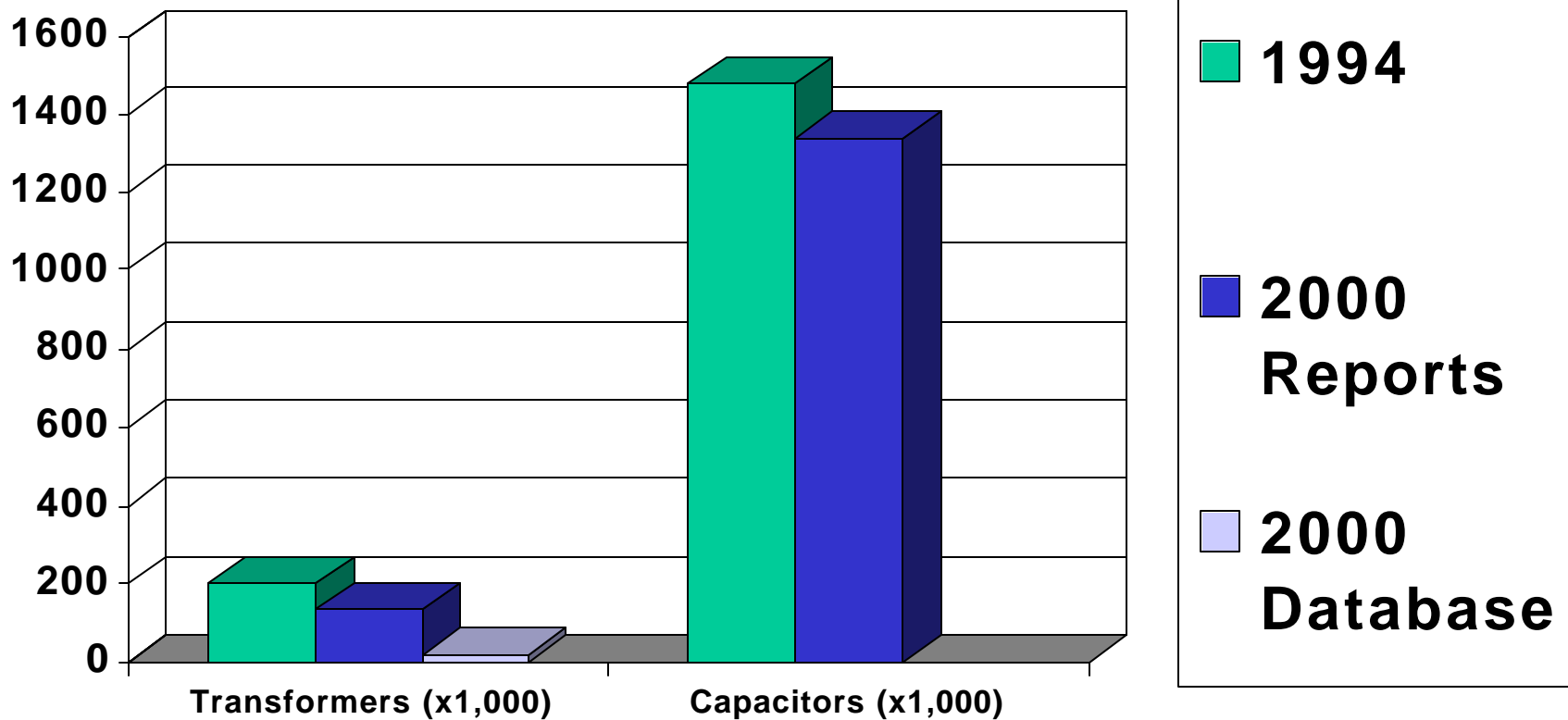
Canadian Accomplishments

High Level PCBs and No. of Storage Sites in Ontario, Canada



U.S. Accomplishments

PCB (>500 ppm) Transformers and Capacitors Based on Annual Disposer Reports



Progress on the Canadian PCB Challenge (1994-2001)

- **As of April 2001, 80% of high level PCB (Askarel > 1%, 10,000 ppm) had been destroyed in Ontario compared to 1993**
- **703 Federal (248) and Private (455) sites are now PCB-free in Ontario (No PCB in storage or in use)**

Industry Sector PCB Success Stories

The Utilities Sector

- **42 electrical utilities submitted their voluntary reduction commitment letters to Environment Canada**
- **A number of small to medium utilities in Ontario achieved 90% or better PCB reduction target**

Industry Sector PCB Success Stories

The Automotive Sector

- **The Canadian Automotive Industry destroyed 4,359 kgs and 133,495 litres of high level PCBs**
- **GM; St. Catherines, Ontario, is PCB-free**
- **Daimler-Chrysler, Canada removed all high level PCBs**

Industry Sector PCB Success Stories

The Steel Sector

- **Algoma voluntarily committed to eliminate 71,103 kgs (44,400 litres) of PCBs by December, 2005 and destroyed 13,300 kgs (8300 litres)**
- **Stelco achieved 91% reduction of PCB in storage and 41% reduction in service**
- **Slater Steel removed all PCBs by 1998**
- **The Steel Sector still has a large amount of PCB in use (transformers/capacitors)**

Industry Sector PCB Success Stories

Others

- **CPPI (Canadian Petroleum Producers Institute)**
 - ◆ **CPPI and its members eliminated 90% of PCB**

- **City of Windsor**
 - ◆ **Local Municipalities in Windsor and Essex County sent 65,000 kgs of PCB contaminated materials to Swan Hills for destruction**

PCB Outreach/Communication

- **Environment Canada, in partnership with U.S. EPA conducted an email survey for PCB Workgroup's recommendations in November, 2001 on current BNS-PCB Website: www.epa.gov/glnpo/bns/pcb/**
- **Survey results were analyzed and recommendations will be incorporated**
- **BNS PCB Website will be modified continuously with these updates**

Barriers/Challenges

- **We need participation by organizations not represented by current GLBTS stakeholders**
- **We need implementation of GLBTS communication strategy to reach more stakeholders**
- **We need to focus on priority industry sectors**
 - ◆ **Steel Sectors still have high level PCBs in use in Canada**
 - ◆ **Mining, Pulp and paper,Utility**
 - ◆ **PCB reduction in sensitive sectors (School/Food/Hospitals etc.)**

Stakeholder Roles

- **Continued participation, exchanging information and ideas**
- **Outreach/communication on GLBTS and PCBs (risks and benefits of reducing PCBs) to others in organizations or industries**
- **Active support on implementation of GLBTS communication strategy and sector initiative**

Upcoming Actions for Canada/U.S.

- **Improve Database Tracking**
- **Identify major industry sectors in GLB**
- **Continue seeking PCB reduction commitments**
- **Work with Integration Group, ECB(Canada), and major industry associations,**
- **Expand GLBTS commitment letters to other Lakes Basin**
- **Improve Websites, Outreach Brochures, Info Packages, Fact Sheets etc.**
- **Compliance Promotions and Workshops**

Upcoming Actions for Canada/U.S. (cont.)

- **National mailing on PCB reductions (U.S.)**
- **Publications of draft PBT National Action Plan for PCBs (U.S.)**
- **Initiatives to address PCB equipment at**
 - ◆ **Federal facilities**
 - ◆ **Mines**
 - ◆ **Minnesota/Lake Superior: Small Quantity PCB Owner Disposal Co-operative - Pilot (GLNPO funded)**

Dioxins and Furans

Work Group Co-Chairs:

Anita Wong, Environment Canada

Erin White, U.S. EPA

Dioxin/Furan Challenges

Canada

- **90% reduction***
- **by 2000**

***All media within Great Lakes Basin**

United States

- **75% reduction ***
- by 2006**

***Aggregate of air releases nationwide and water releases within Great Lakes Basin**

Accomplishments

Canada:

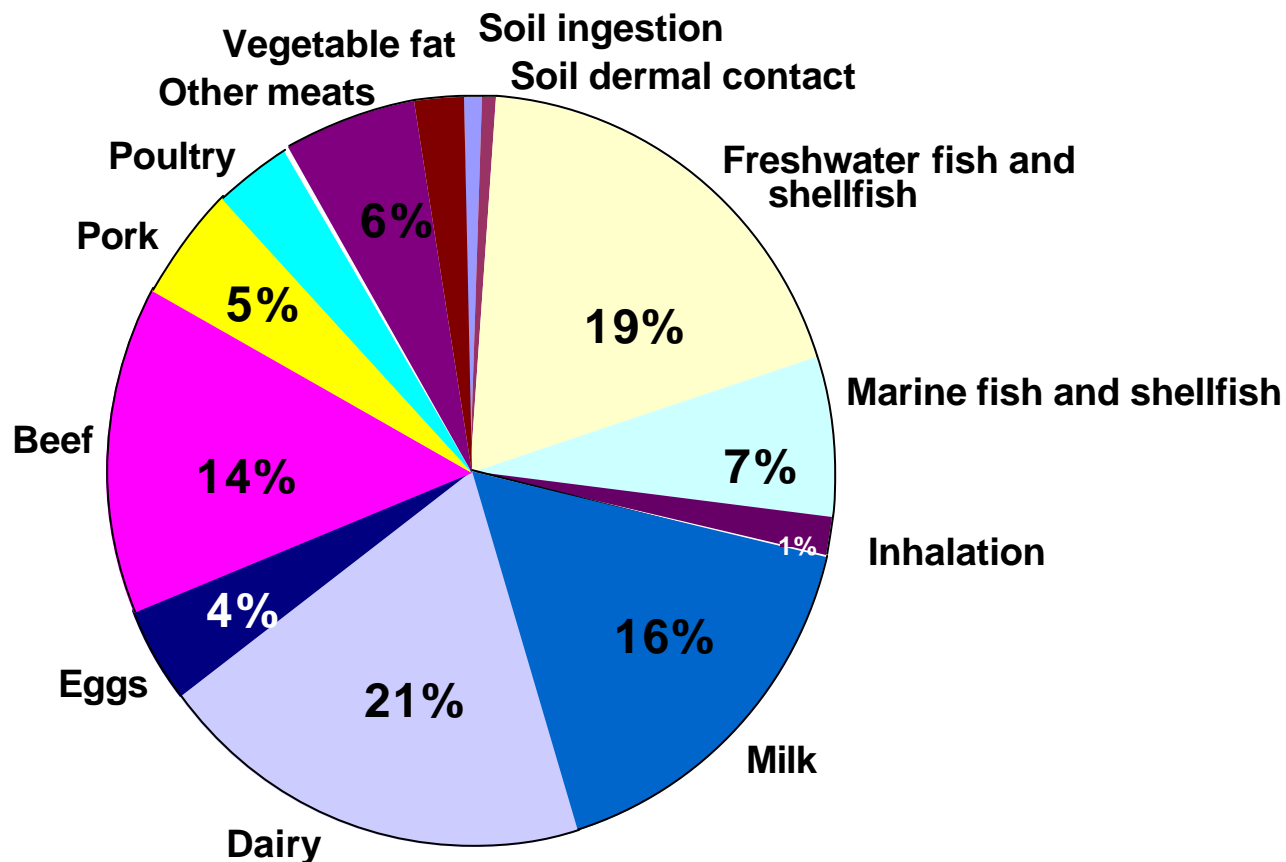
- **79% (49 grams) reduction on total release within GL Basin**
- **Total release in 2000 = 50.5 grams**

United States

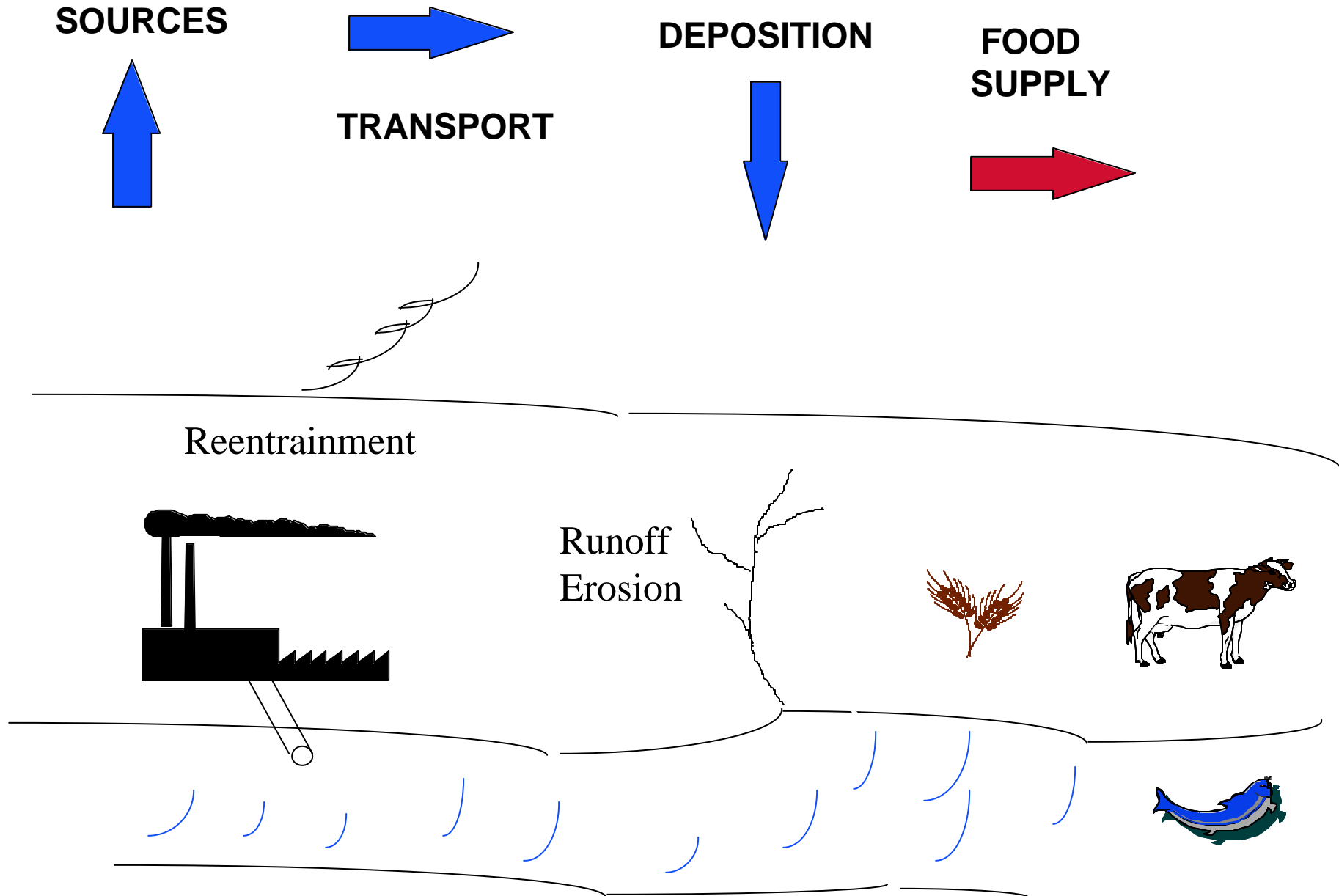
- **77% (10,743 grams) reduction on total release within U.S.**
- **Total release in 1995 = 3,252 grams**

U.S. Adult Average Daily Intake of CDDs/CDFs/Dioxin-like PCBs

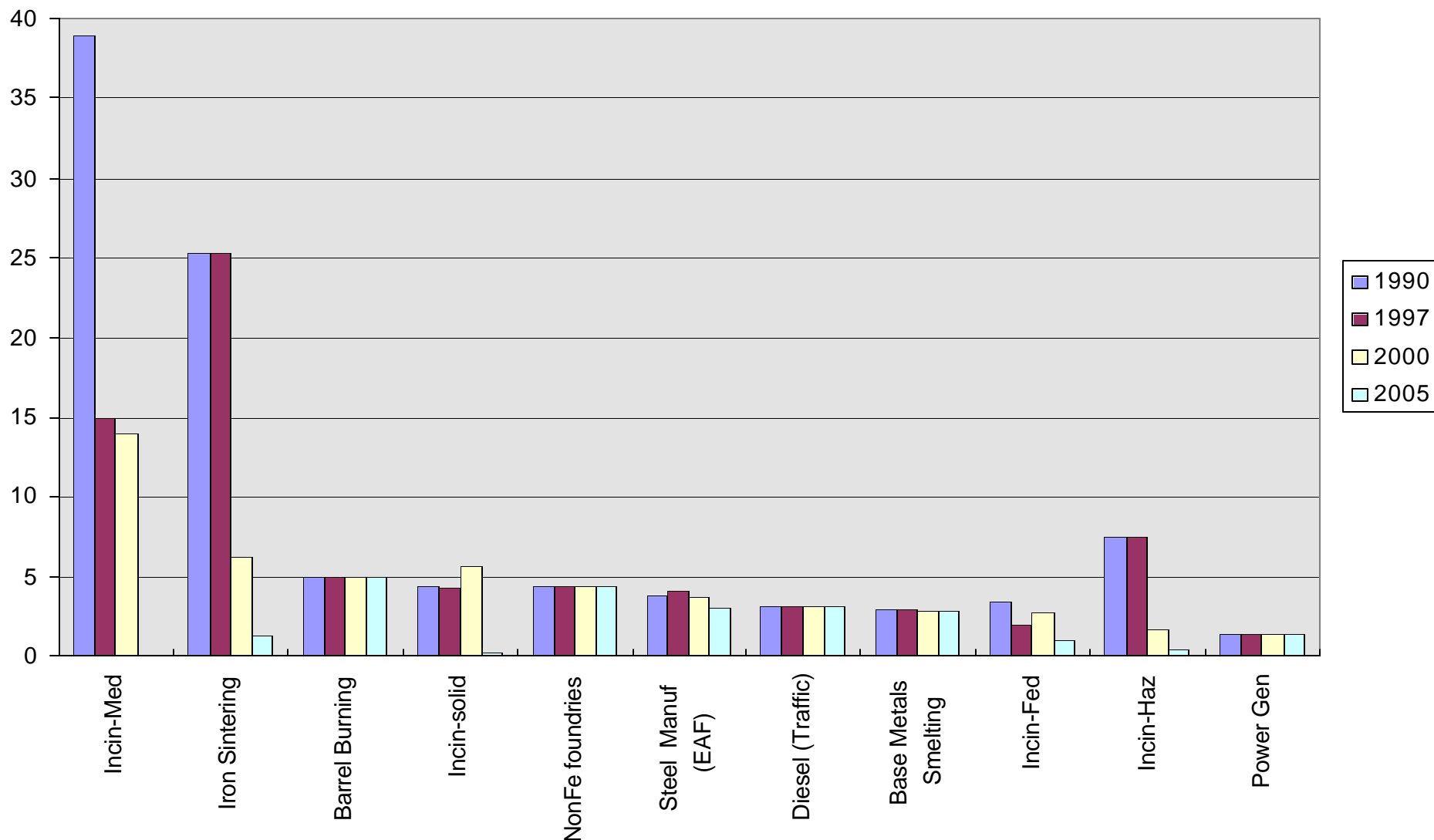
2000 Draft Estimate: ~ 65 pg TEQ_{DFP}-WHO₉₈/day



Sources and Pathways to Human Exposures



Ontario D/F Air Releases and Forecast (grams per year)



Challenge Gap - Canada

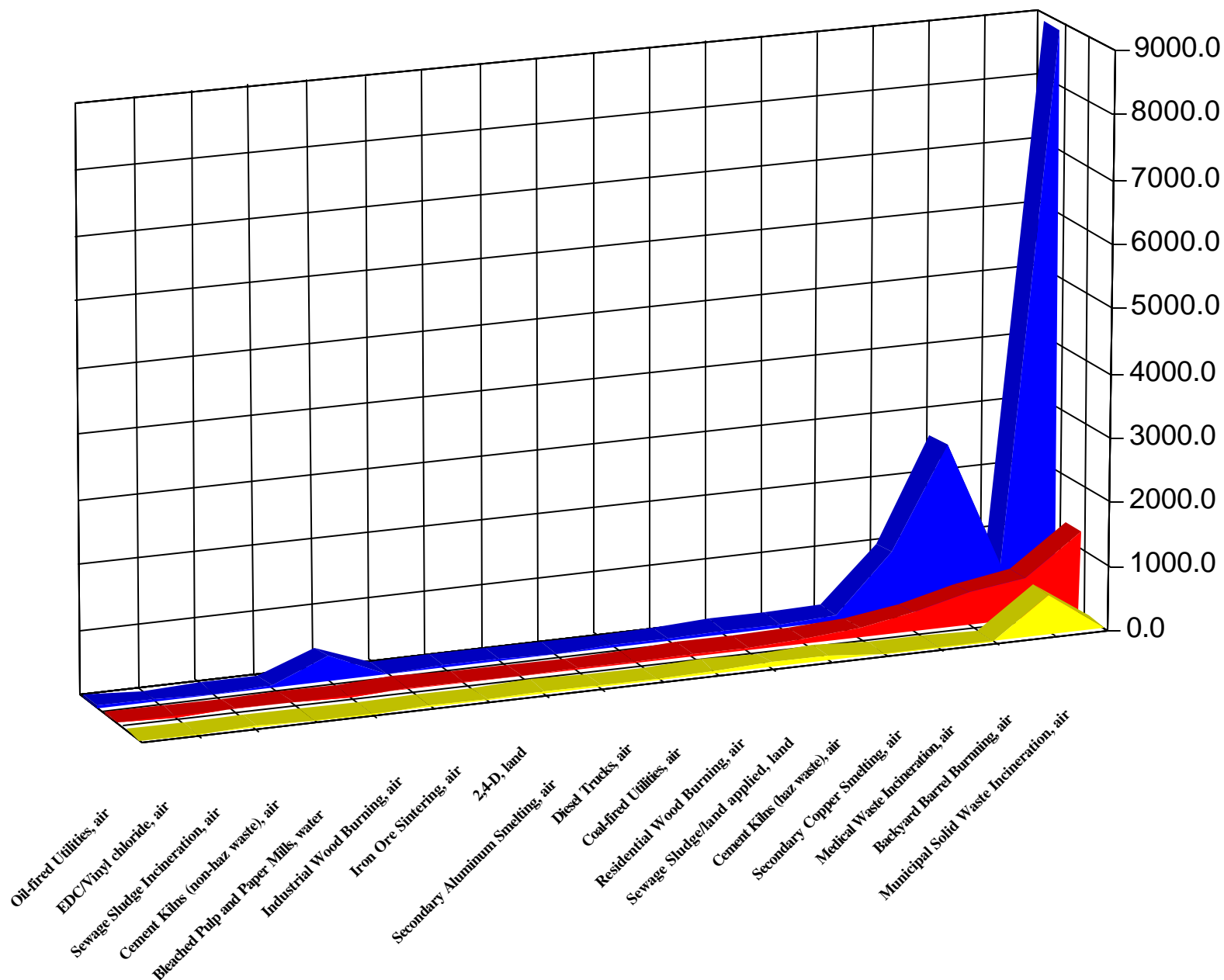
New Canada-Ontario Agreement extends dioxins and furans 90% target to 2005

To achieve 90% reduction:

- Waste incinerators (22.5 grams, 93% reduction):
 - ◆ Canada-wide standards (80 pg/m³ by 2006)
 - ◆ Possible phase out of hospital incinerators by Ontario
 - ◆ Federal Hazardous Waste Regulations
 - ◆ Shut down of SWARU and OPG Kincardine incinerators
- Iron sinter (5 grams, 80% reduction)
 - ◆ Canada-wide Standards (500 pg/m³ by 2005)
- Other sources: electric arc furnace, burn barrel, coal fired power plants, base metal smelters, wood preservation
- Burn barrel becomes the highest source of dioxins/furans

Major U.S. Dioxin Sources

1987
1995
2004



Poorly Characterized Sources

- Secondary metal smelting
- Coke production
- Ceramic manufacturing
- Clay processing
- Ferrous and non-ferrous foundries
- Asphalt mixing plants
- Primary magnesium
- TiO₂
- Petroleum refineries
- Cu wire recycling
- Res. Wood burning
- Crematoria
- Forest fires
- Brush fires
- Range fires
- Ag burning
- Landfill Fires
- Structural fires
- Landfill flares
- Ash Disposal
- Rural soil erosion to water
- Urban runoff to surface water
- Utility poles and storage yards
- Landfill fugitive emissions
- Transformer storage yards

Barriers

- **Information gaps in inventory**
- **Engaging stakeholders to help fill gaps**
- **Lack of data or estimation methodology**
- **Measurable results for some issues eg. burn barrel are long term (behavioural change)**

Upcoming Actions

- **Continue implementation of Burn Barrel Strategy**
- **Review waste management guidelines/strategy for out-of-service utility poles**
- **Possible testings on residential wood stoves**
- **Address medium and no priority sectors**
- **Update information for incinerator ash management and landfill fires**
- **Address information gaps for Great Lakes Basin-gather information and estimate releases**

Burn Barrel Subgroup



Photo Courtesy of U.S. EPA



*Graphic Courtesy of
University of Wisconsin Extension*

- **Subgroup initiated in Spring 2000.**
 - ◆ Participation from state, provincial and federal governments, Tribes, First Nations, public, industry and educators in Minnesota, Wisconsin, Illinois, New York, and Ontario
- **Reducing Household Garbage Burning Strategy** (May 2001) based on education, infrastructure, and enforcement.
- **Initial focus on Lake Superior Region combining ongoing efforts in Minnesota, Wisconsin and Ontario**
 - ◆ Integration with Lake Superior LaMP activities
- **Outreach Materials**
 - ◆ Western Lake Superior Sanitary District
 - ◆ University of Wisconsin Extension
 - ◆ Environment Canada/EcoSuperior

Great Lakes Trash And Open Burning Website

<http://c2p2online.com> and click on Affiliated Websites.

May 23, 2002

Tell a Friend



HOT NEWS	C2P2 Story	Site Map	Search	Home	P2 Dialogue	Contact Us
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Great Lakes Trash and Open Burning Website

Background

Concerns About Burning

Legislative-Policy Framework

Programs/Strategies

Successes

What's New?

Key Contacts

"Members Only"

"reducing the practice of residential garbage burning within the Great Lakes Basin."



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Disclaimer

Stakeholder Roles

- **Participate in Work Group meetings**
- **Provide updates on reduction activities**
- **Help improve release inventory**

Value-Added

- **New actions:**
 - ◆ **Burn barrel strategy**
 - ◆ **USWAG survey and guidelines development**

- **Enhanced national activities:**
 - ◆ **Inventory improvement - stack tests, data collection**
 - ◆ **Residential wood stove test**
 - ◆ **Development of LOQ**
 - ◆ **Enhanced ambient air monitoring network**

B(a)P and HCB

Work Group Co-Chairs:

Tom Tseng, Environment Canada

Steve Rosenthal, U.S. EPA

B(a)P and HCB Challenges

United States

“Seek by 2006, reductions in releases that are within, or have the potential to enter, the Great Lakes Basin, of HCB and B(a)P from sources resulting from human activities”

Canada

“Seek by 2000, a 90% reduction in releases of HCB and B(a)P resulting from human activities in the Great Lakes basin, consistent with the Canada Ontario Agreement”

Accomplishments

Estimated Reductions (since ~ 1988):

Canada: (Great Lakes)

- **HCB ~ 65% reduction**
- **B(a)P ~ 45% reduction**

United States:

- **HCB (nationally) ~ 90% reduction from chlorinated solvents and pesticides manufacturing**
- **B(a)P (Great Lakes) ~ 65% reduction from coke ovens**

Accomplishments:

Recent Canadian Progress

- **SOPs being implemented for steel mills and wood preservers, EMA signed with Dofasco, Algoma Steel;**
- **HCB and B(a)P (PAHs) release inventories updated for Ontario based on release data submitted under new NPRI reporting requirements.**
- **Canada Wide Standards developed for Hg, PM, Ozone and are being finalized for dioxins and furans, B(a)P and HCB releases expected to drop in next 5 to 10 years .**
- **Canada Ontario Agreement renewed - Harmful Pollutants Annex for additional reduction efforts**

Accomplishments:

Recent United States Progress

- **Wood Stove Change-out Programs with Hearth Products Association completed in 12 states;**
- **Discussions with the scrap tire sector to reduce fires;**
- **Steps 1, 2 and 3 reports have been completed and posted on the web site; Addendum to the HCB Steps 1 & 2 reports drafted to include 1996 NTI information;**
- **Disputed HCB emission levels from utility coal combustion and rubber tire manufacturing have been resolved;**
- **Disputed B(a)P emission levels from petroleum refineries have been resolved;**
- **USEPA's national HCB inventory has gone from 2,368 lbs/yr in 1990 to 600 lbs/yr in 1996, largely through emissions reductions in chlorinated solvent and pesticide manufacturing.**

Major Source Sectors

B(a)P:

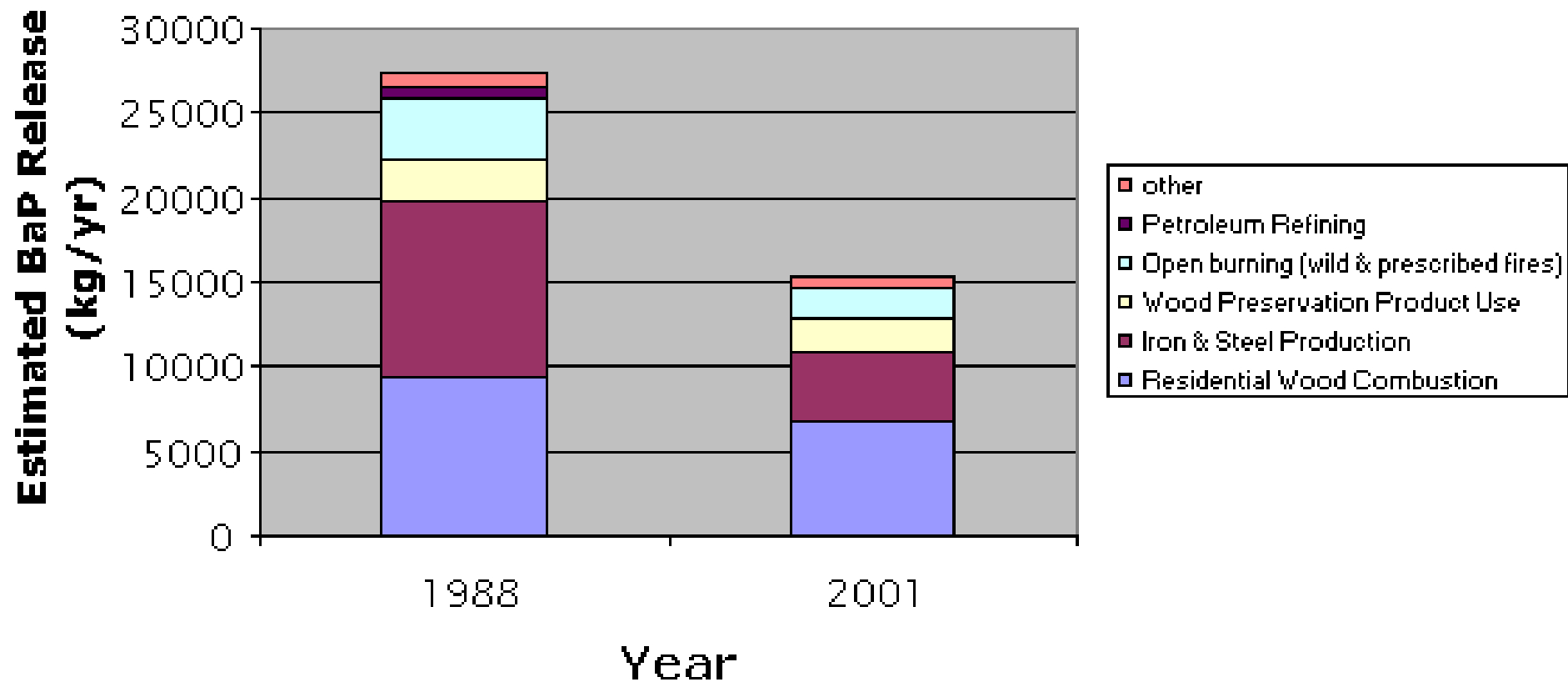
- **Coke ovens**
- **Wood preservation**
- **Residential wood
combustion**
- **Open burning**

HCB:

- **Chlorinated solvents and
pesticides manufacturing**
- **Chlorine production**
- **Pesticide applications**
- **Waste incineration**

Canadian B(a)P Challenge Gap

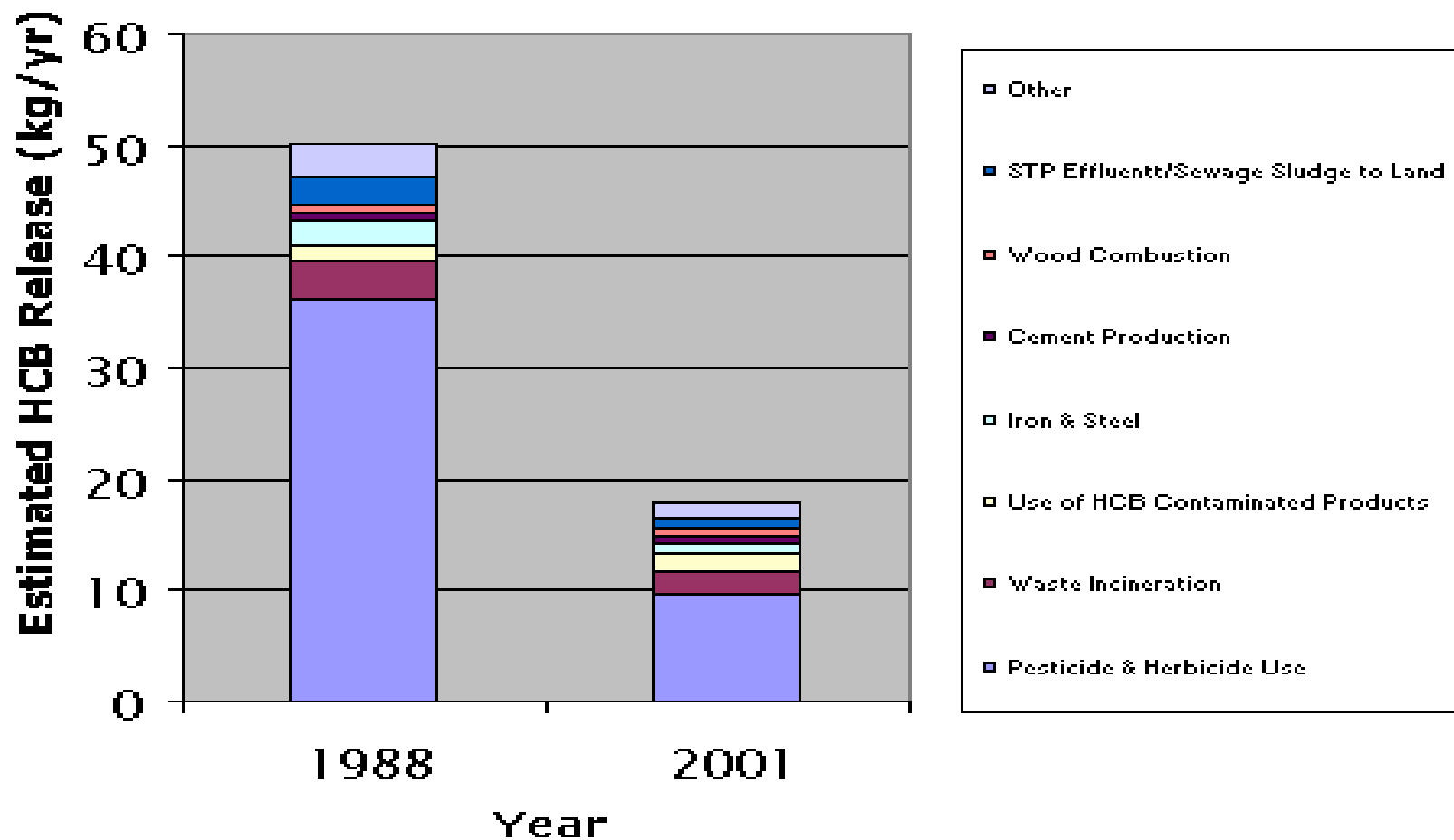
Estimated Ontario BaP Releases



Anticipated Future B(a)P Reductions (Canada)

Major BaP Source Sectors	Estimated Current % Ontario BaP Releases	Anticipated Reduction 2005
Residential Wood Combustion	44%	Significant
Iron & Steel production	27%	Significant
Wood Preservation Product Use	13%	No Estimate
Open Burning (wild & prescribed fires)	11%	No Significant Change
Other	5%	No Estimate
	Overall reduction 45%	Overall reduction anticipated 60%

Estimated Ontario HCB Releases



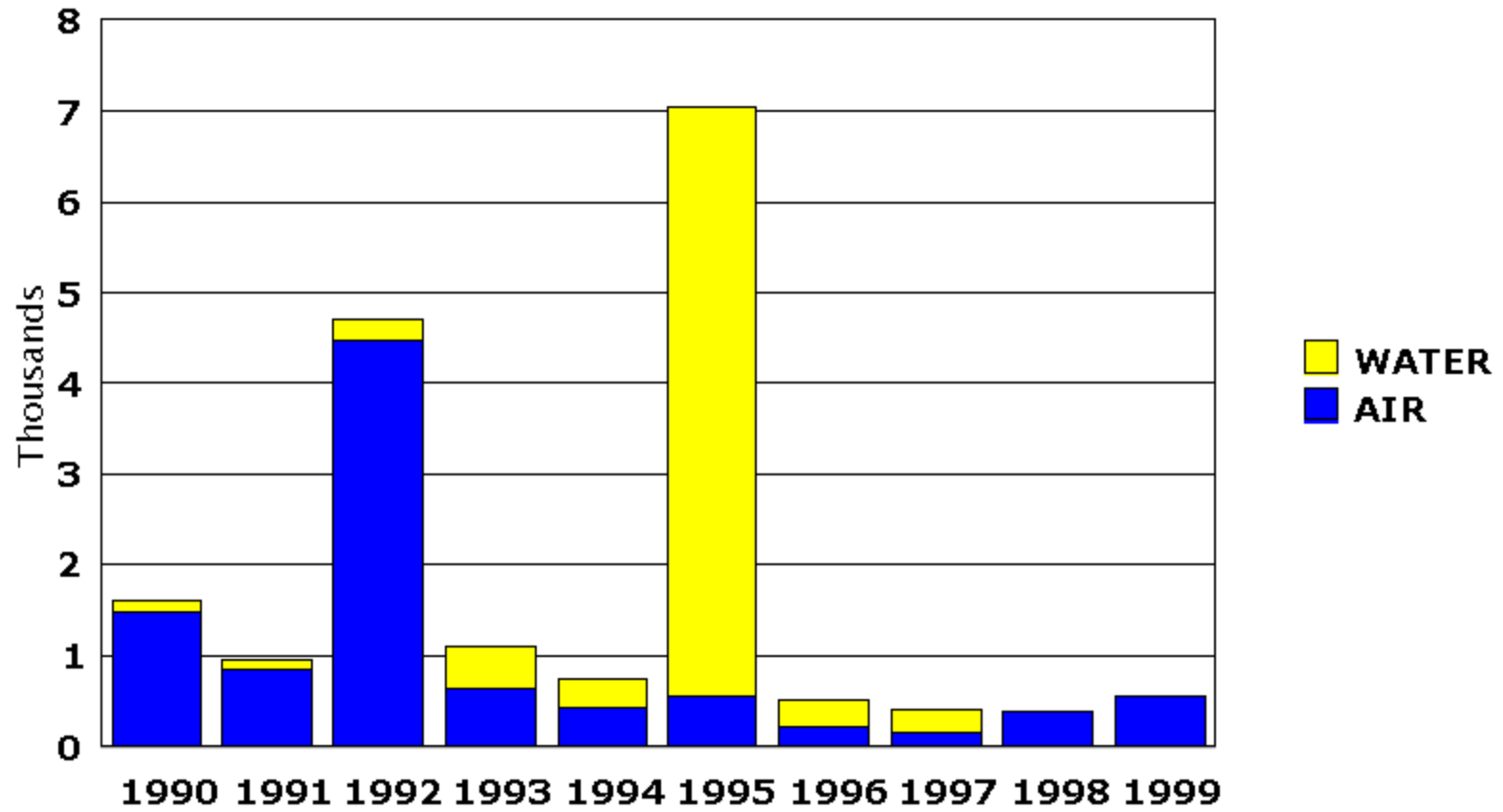
Anticipated Future HCB Reductions (Canada)

Major HCB Source Sectors	Current Ontario HCB Release (Estimate)	Anticipated Reduction Next 5 years
Pesticide & Herbicide Use ¹	54%	No estimate
Waste Incineration ²	13%	Significant
Use of HCB Contaminated By-Products	8%	No estimate
Iron & Steel	6%	Significant
Cement Production	4%	No estimate
Wood Combustion	4%	Significant
Sewage Treatment/ Land Application of Sewage Sludge	5%	No estimate
Other	6%	Minor
	Overall Current HCB Reduction 65% (1988 – 2001)	Overall Anticipated HCB Reduction 80% (1988 – 2006)

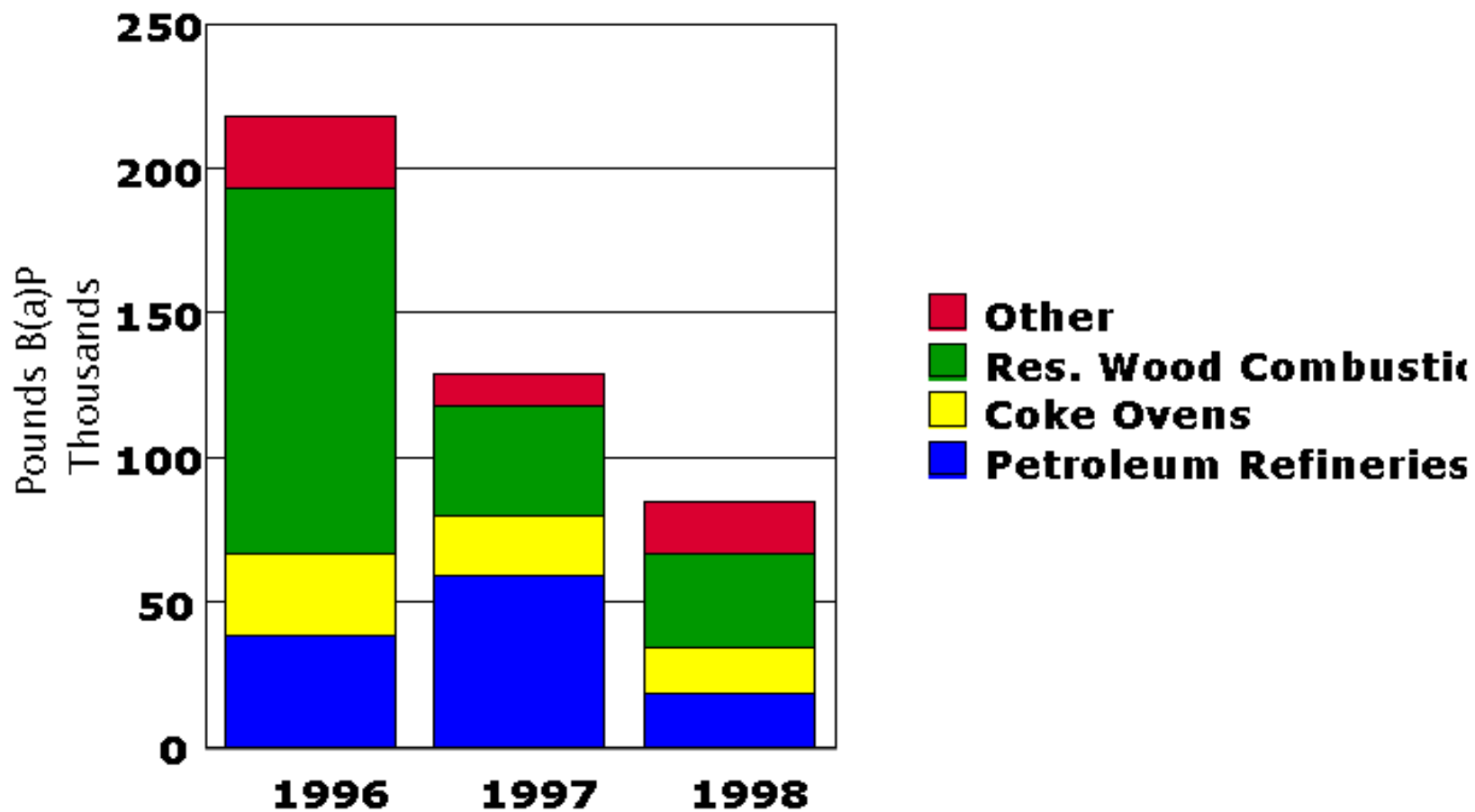
1 – HCB concentration levels used to estimate releases from this sector under review

2 – Includes releases from municipal, biomedical, sewage sludge and hazardous waste incinerators, and barrel (trash) burning

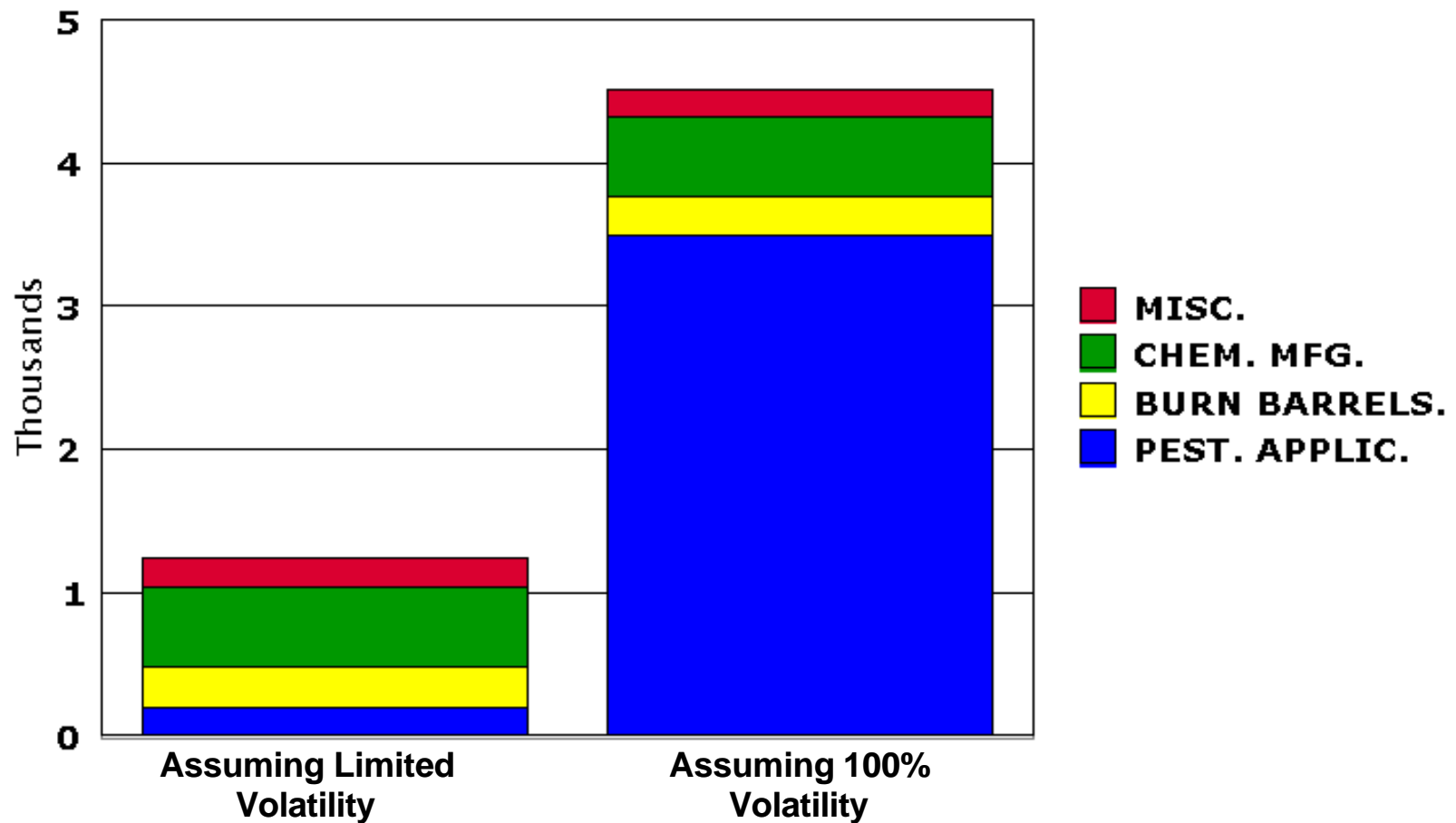
HCB TRI-Reported Emissions (lbs/yr)



Great Lakes B(a)P Emissions



Estimated U.S. HCB Emissions (lbs)



Barriers

- **Lack of chemical use and emission data;**
- **Many source sectors;**
- **Need to recruit Work Group members;**
- **Need to initiate more sector-specific projects.**

Upcoming Actions

- **Working with pesticides and other sectors to refine release estimates;**
- **Meetings with facilities not reporting or with ‘Low Confidence’ NPRI estimates**
- **Voluntary stack testing**
- **New prevention projects -- e.g., scrap tires;**

Stakeholder Roles

- **Conduct stack and effluent testing;**
- **Provide release estimates;**
- **Verify and resolve differences in emission factors;**
- **Undertake P2 and remediation projects;**

Value - Added

- **Information sharing;**
- **Exchange of ideas;**
- **Stack/effluent testing + ambient monitoring**
- **NPRI reporting requirements for B(a)P, HCB**
- **Verification of release estimates;**
- **Completion of BTS Steps 1, 2 and 3 reports for B(a)P and HCB**

Mercury

Work Group Co-Chairs:

Robert Krauel, Environment Canada

Alexis Cain, U.S. EPA

Canada's Mercury Reduction Challenge and Progress

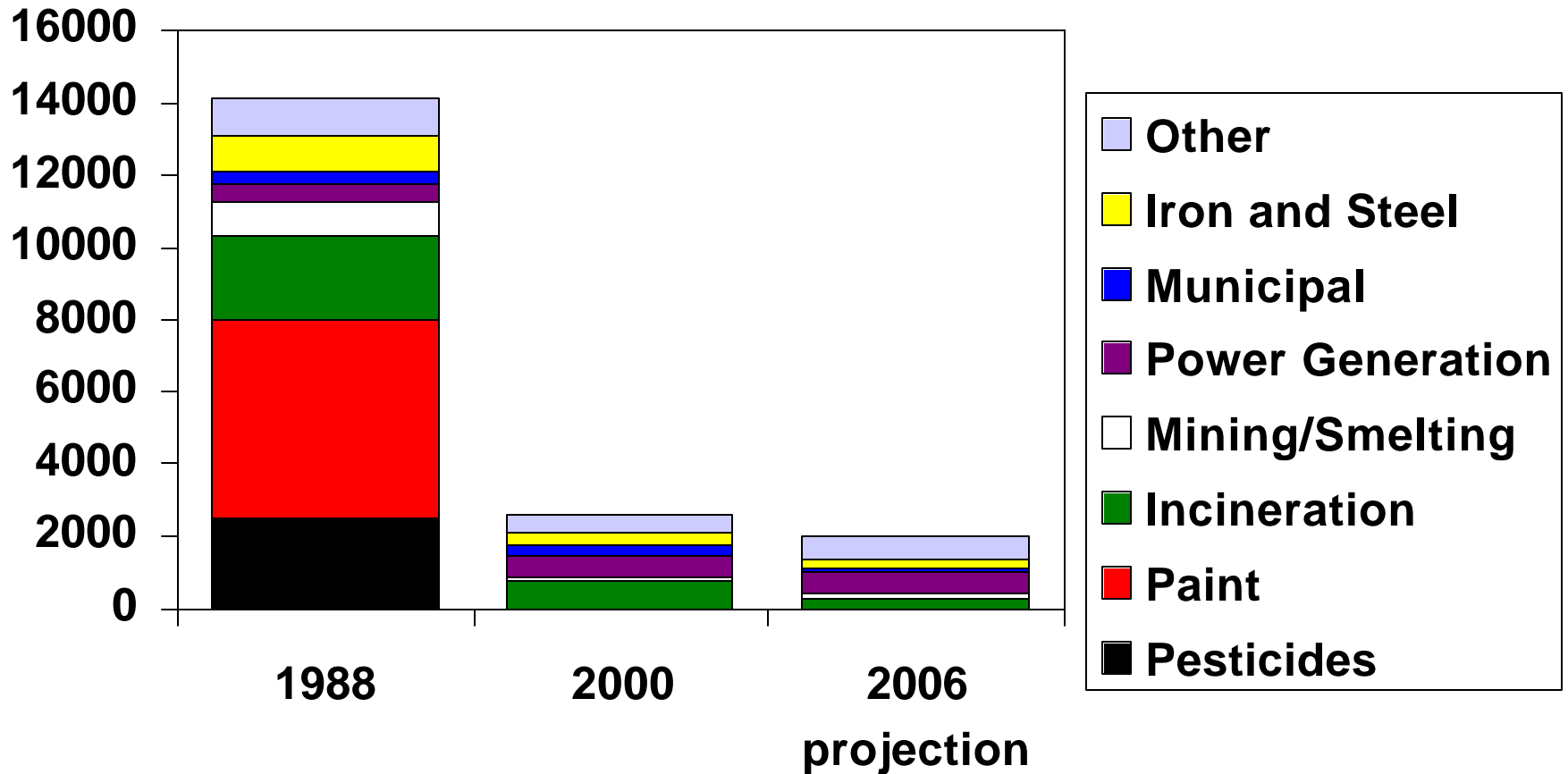
Challenge

“Achieve by 2000, a 90% reduction in the release of mercury, or where warranted the use of mercury, in the Great Lakes Basin”

Baseline: 1988

Progress: Approximately 78% reduction

Ontario Mercury Releases (kg)



U.S. Mercury Reduction Challenge and Progress

Challenge:

“Achieve by 2006 a 50% reduction in use and air emissions of mercury nationwide”

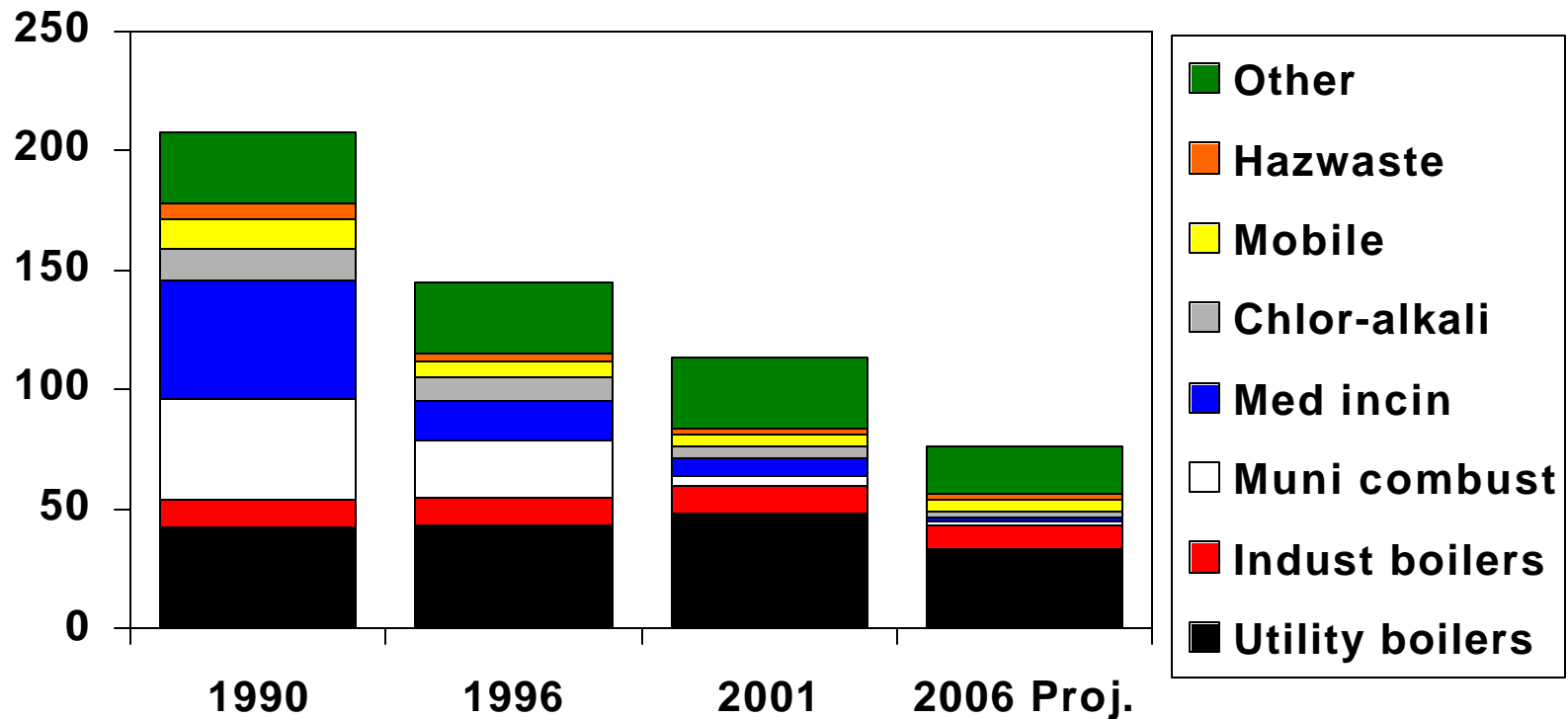
Baseline:

- Emissions: 1990
- Use: 1995

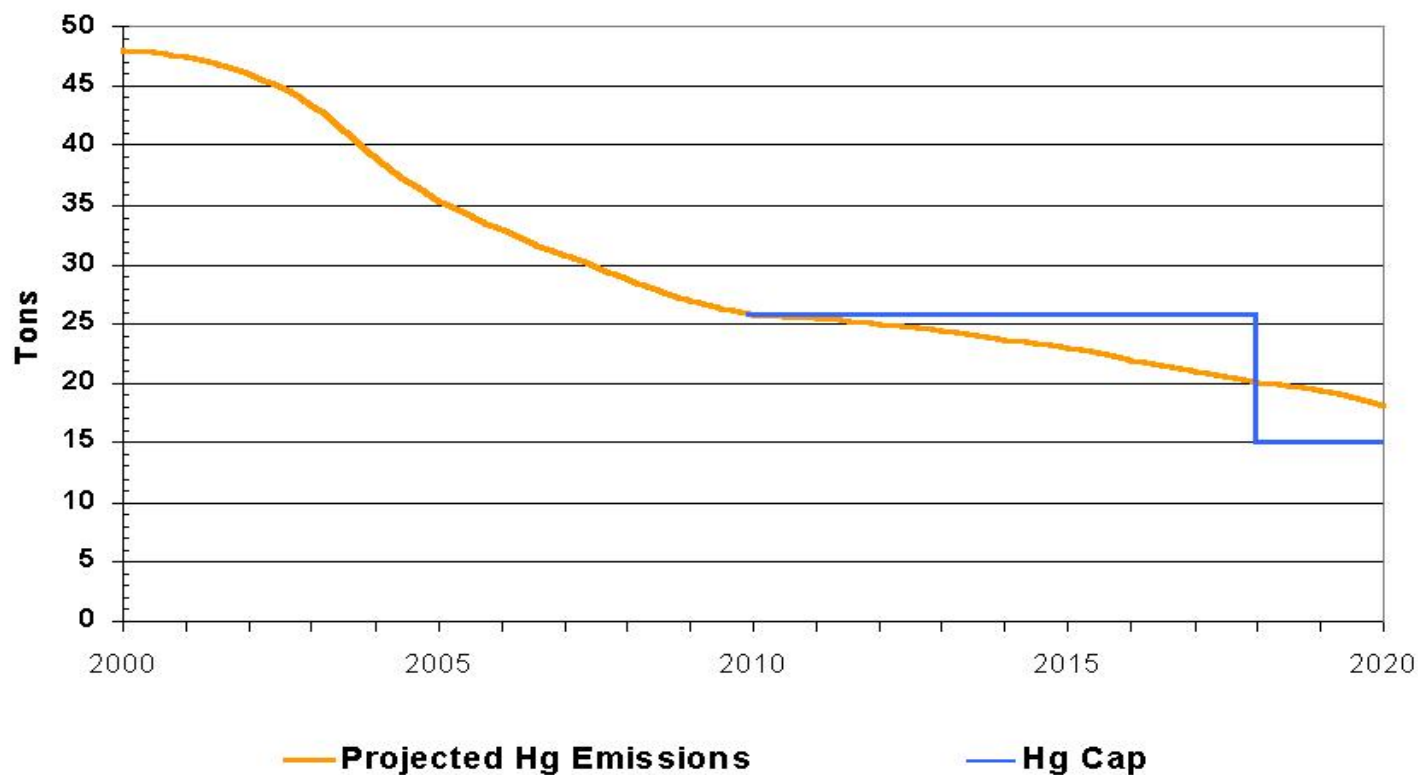
Progress (best guess)

- Emissions: > 40% reduction
- Use: > 50% reduction

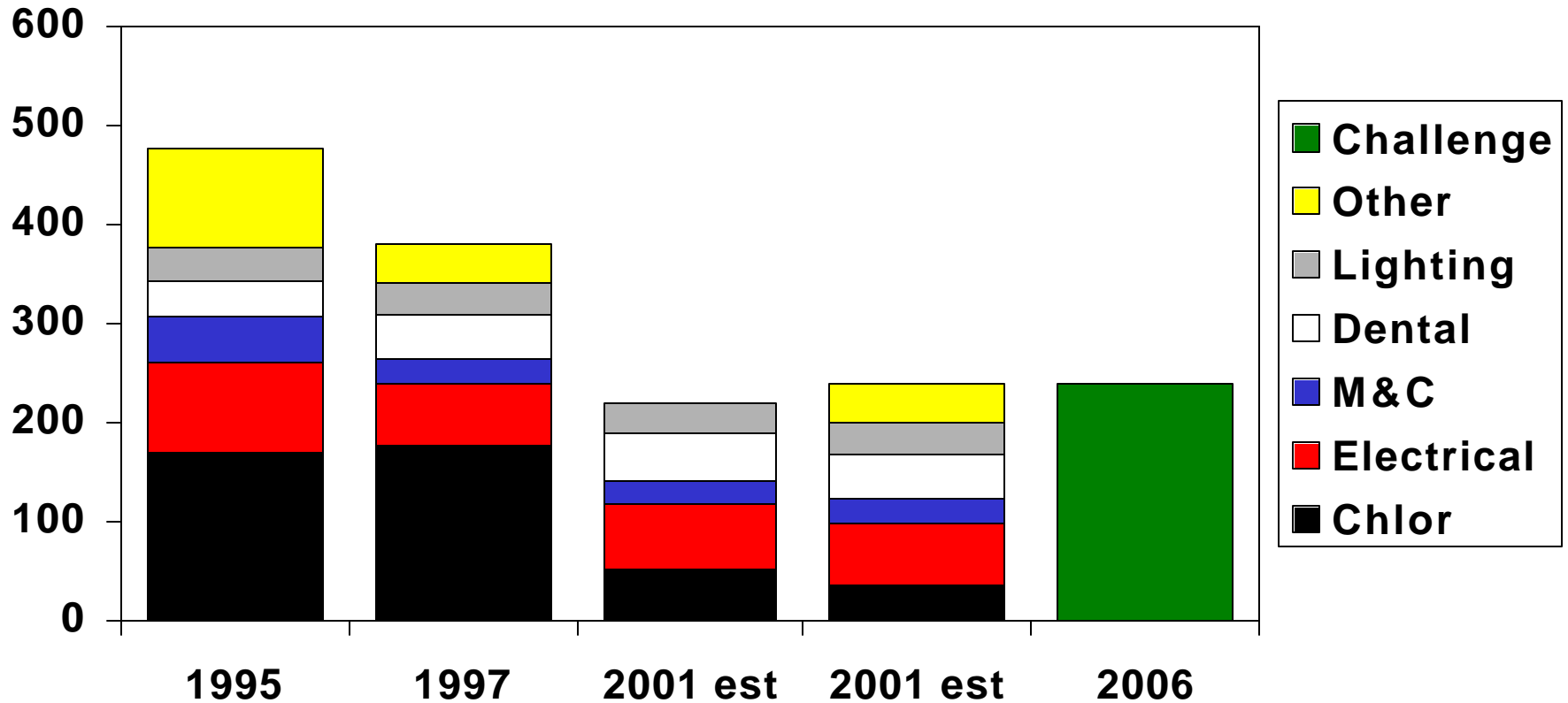
U.S. Mercury Releases (tons)



Hg Emissions from Electricity Generators: Emissions Compared to the Cap under the Clear Skies Initiative



U.S. Mercury Use (tons)



Mercury Accomplishments: 2001-2002

- **U.S. Chlor-Alkali Industry achieves voluntary reduction commitment!**
 - ◆ **81% reduction; 75% capacity-adjusted**
 - ◆ **Continued reporting through 2005**
- **Clear Skies Initiative proposed**
- **H2E recognition programs implemented**
- **Expedited schedule for eliminating mercury switches in new cars**
- **UNEP Mercury Study**
- **Quicksilver caucus launched**

Where will we be in 2006?

- **Challenges likely to be achieved**
- **Regulations/Standards in place for major source sectors:**
 - ◆ **Incinerators**
 - ◆ **Power plants**
 - ◆ **Industrial boilers – minor reductions**
 - ◆ **Chlor-alkali plants**
 - ◆ **Base Metal Smelters**
 - ◆ **Electric arc furnaces (possibly)**
- **Potential future “residual risk” regulations**
- **Expanded State legislation on products/releases**

Where will we be in 2006?

- **Most mercury uses eliminated or waning?**
- **Alternative energy-efficiency lighting beginning to take market share?**
- **Dental amalgam use: separators in Canada; US?**
- **Remaining stocks of mercury devices:**
 - ◆ **Autos: State and Provincial programs (GLU and Clean Air Foundation)**
 - ◆ **Appliances and industrial machinery**
- **Success leads to Mercury surplus?**

Value-Added

- **Forum for publicizing good work; promoting voluntary projects; networking**
- **Raised awareness on mercury-in-scrap**
- **Helped make case against thermometers**
- **Survey says: you like us, you really like us! If you notice us at all.**
- **Industry responses: so far so good, but approaching diminishing returns.**

Upcoming Actions

- **Continued promotion of mercury reductions in steel scrap**
- **Promote reduced releases from dental mercury – issue focus for next meeting?**
- **Address industrial boilers? Portland cement?**
- **Improve website**
- **Continued tracking of use and release**
- **Start to track results in the environment**

Role for Workgroup Beyond 2006?

- **Evaluation of impact of use/release reductions on deposition, fish**
- **Virtual Elimination**
- **Previously unknown sources?**
- **Address overseas sources?**
- **Diminished need for workgroup activity?**
 - ◆ **More limited focus areas for workgroup?**
 - ◆ **Fewer meetings?**

Alkyl-Lead

Work Group Co-Chairs:

Elizabeth Rezek, Environment Canada

Anthony Kizlauskas, U.S. EPA

Alkyl-Lead Challenges

United States

“Confirm by 1998, that there is no longer use of alkyl-lead in automotive gasoline.”

“Support and encourage stakeholder efforts to reduce alkyl-lead releases from other sources.”

Canada

“Seek by 2000, a 90 percent reduction in use, generation, or release of alkyl-lead consistent with the 1994 COA.”

Alkyl-Lead Accomplishments

- **U.S. Challenge Achieved**
 - ♦ **Documented in report issued June 2000**
- **Canadian Challenge Achieved**
 - ♦ **98% reduction from 1988 to 1997 - documented in report issued January 1999**
- **Steps 1,2,3 Reports (Sources, uses, regulations, releases, options for reductions):**
 - United States**
 - ♦ **Issued June 2000**
 - Canada**
 - ♦ **Issued January 1999**

Challenge Gap/Beyond the Challenge

Remaining Permitted Uses:

- **Aviation Gasoline ~ 300 million gallons/year U.S.**
~ 27 million litres/ year (Ontario)
- **Automobile Racing Gasoline**
 - ◆ **Some racing series in NASCAR, NHRA, SCCA, CART**
 - ◆ **Total use ~ several 100 thousand gallons/year**
- **For Perspective:**
 - ◆ **Unleaded Gasoline ~ 130 billion gallons/year U.S.**
~ 13.3 billion litres/year (Ontario)

Barriers

Aviation Gasoline:

- **Safety issue – poor performing alternative gasoline would be life-threatening**
- **Extensive testing needed for lead-free substitutes for variety of engine and airframe configurations under spectrum of potential flight conditions**
- **After development of alternative fuel, distribution system needs to be developed**
- **Despite gathering momentum and encouraging recent progress in the Coordinating Research Council's research program, lead-free aviation gasoline still several years away**

Barriers

Racing Gasoline:

- **Development needed for alternative octane-enhancing additives to achieve needed performance**
- **Alternative additives must be environmentally safe**

Upcoming Actions

- **Reduction activities on remaining uses national and international in scope**
- **In U.S., work through National PBT Program**
- **In both countries, continue discussions with automobile racing organizations and coordinate efforts between U.S. and Canada**
- **Periodically communicate progress in reductions, technology developments, regulations through GLBTS outlets**
- **Special meetings/workshops as appropriate for outreach and technology transfer**

Stakeholder Roles

Aviation Gasoline:

- **Continued efforts from FAA and Coordinating Research Council (partnership working on lead-free substitutes to high-octane aviation gasoline)**

Racing Gasoline:

- **Continued leadership from NASCAR in introducing lead-free racing gasoline**
- **EPA technical assistance on environmental impacts of alternative additives**
- **Participation by additional race-sanctioning bodies**

Value-Added

United States

- ♦ **Lended support to lead-free aviation gasoline and racing gasoline research programs**
- ♦ **GLBTS alkyl-lead challenges and reduction actions adopted by USEPA in National PBT Program**

Value-Added

Canada

- **Collection of additional information on aviation sources, uses and releases. Two reports completed:**
 - ◆ **“Airborne Particulate Matter, Lead and Manganese at Buttonville Airport” May 2000.**
 - ◆ **“Survey of Ontario Airports Aviation Fuel Use, Consumption and Storage” June 2002.**
- **Continue to monitor quantities of alkyl lead use in competition vehicles.**
- **Coordinate with U.S. efforts with respect to the aviation and competition vehicle sectors.**

Level I Pesticides and Octachlorostyrene

Pesticides Work Group Co-Chairs:
Edwina Lopes, Environment Canada
David Macarus, U.S. EPA

Octachlorostyrene Work Group Co-Chairs:
Darryl Hogg, Environment Canada
Frank Anscombe, U.S. EPA

Pesticides and OCS Challenges

United States

“Confirm by 1998 that there is no longer use or release from sources that enter the Great Lakes Basin of five bioaccumulative pesticides (chlordanes, aldrin/dieldrin, DDT, mirex, and toxaphene), and of the industrial byproduct/contaminant octachlorostyrene. If ongoing, long-range sources of these substances from outside of the U.S. are confirmed, work within international frameworks to reduce or phase out releases of these substances.”

Canada

“Report by 1997, that there is no longer use, generation or release from Ontario sources that enter the Great Lakes of five bioaccumulative pesticides (chlordanes, aldrin/dieldrin, DDT, mirex, and toxaphene), and of the industrial byproduct/contaminant octachlorostyrene. If ongoing, long-range sources of these substances from outside of Canada are confirmed, work within international frameworks to reduce or phase out releases of these substances. “

Accomplishments Level I Pesticides

- **All uses of the Level I pesticides have been cancelled**
- **All production facilities have been closed**
- **Documented in Reports:**
 - ◆ **United States - 2000**
 - ◆ **Canada – 1997**
- **Voluntary collections of unused pesticides ongoing**

Barriers

Level I Pesticides

- **Continued presence of existing stocks of pesticides**
- **Contaminated sites not yet remediated have potential to release Level I pesticides to the Great Lakes**
- **Continued usage in other parts of the world**
- **Absence of cost-effective alternative to DDT for malaria (mosquito) control**

Continuing Actions Level I Pesticides

- **Continue to collect unused stockpiles of Level I pesticides throughout the Great Lakes Region**
- **Continue clean-up of sites contaminated with Level I pesticides**
- **Encourage phase-out in other countries**
- **List upcoming actions, meetings, workshops, partnerships, demonstrations, evaluations, etc.**

Stakeholder Roles

Level I Pesticides

Farmers

- **Turn in existing stocks of Level I pesticides in collection efforts**

Agricultural agencies

- **Continue collection efforts for Level I pesticides**

U.S. and Canadian Federal Governments

- **Continue efforts to eliminate use of Level I pesticides worldwide**

Value-Added Level I Pesticides

- **Direct influence on U.S. EPA National Persistent Bioaccumulative Toxics Program**
- **GLBTS used as leverage in international Persistent Organic Pollutants (PoPs) negotiations**

Accomplishments Octachlorostyrene

- **Documented sharp declines in environmental concentrations since the 1960s**
- **OCS has been virtually eliminated in current releases**
- **Past inadvertent releases from chemical production reduced or eliminated by improved production methods**
- **Documented in Reports:**
 - ◆ **United States - December 2000**
 - ◆ **Canada - June 2000**
- **Work Group tasks completed**

Challenge Gap/Beyond the Challenge Octachlorostyrene

- **Continue to explore possible link of OCS production
coincidental to hexachlorobenzene and dioxin production**
- **Collect additional monitoring data to confirm that OCS
levels continue to decline**

Value-Added Octachlorostyrene

- **Advanced scientific knowledge on presence of OCS in the environment**
- **Advanced knowledge of how OCS is formed and released**
- **In December 2000, U.S. EPA and Environment Canada hosted a meeting in Quebec among electrolytic magnesium producers, including tours of two factories, to share information on ways to manage the formation of OCS in this industry.**